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January 22, 2001

VIA HAND DELIVERY

Ms. Magalie R. Salas, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Notification of *Ex Parte* Presentation in ET Docket No. 98-206

Dear Ms. Salas:

Pursuant to Section 1.1206 of the Commission's Rules, 47 C.F.R. § 1.1206, this letter serves as notice that on January 19, 2001, representatives of Virtual Geosatellite LLC ("Virtual Geo") met with the International Bureau staff members Tom Tycz, Ron Repasi, John Martin, Mark Young, and Paul Locke to discuss a new option for an assignment plan to accommodate non-geostationary ("NGSO") fixed-satellite service ("FSS") systems in the Ku-band frequencies made available and designated for NGSO FSS use in the *First Report and Order* in ET Docket No. 98-206. The attached materials were presented and provided to the attendees. Copies of the materials were also provided for absent International Bureau staff members Cecily Holiday and Alex Roytblat. Virtual Geo's representatives at the meeting were Gerald Helman, Raul R. Rodriguez and Stephen D. Baruch.

The original and one copy of this letter are submitted for inclusion in the record of the referenced proceeding.

Respectfully submitted,

Stephen D. Baruch
Counsel to Virtual Geosatellite, LLC

Attachments
cc (w/o att.): Mr. Tom Tycz
Ms. Cecily Holiday
Mr. Ron Repasi
Mr. John Martin

Mr. Mark Young
Mr. Paul Locke
Mr. Alex Roytblat

146914.1

PROPOSAL OF

VIRTUAL GEOSATELLITE, LLC

FOR

AN ORBITAL/SPECTRUM ASSIGNMENT PLAN TO ACCOMMODATE THE APPLICANTS IN THE COMMISSION'S FIRST KU-BAND NGSO FSS PROCESSING ROUND

January 19, 2001

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- The Commission should promote assignment plans that minimize the prospects for post-licensing disputes among systems and that reduce the possibility that the Commission itself will be called upon to resolve coordination disputes.
- Self-executing assignment plans are to be preferred over plans that require the Commission to make post-licensing decisions or interpretations of ambiguities.

- The primary objective of a Ku-band NGSO FSS sharing plan should be to provide all current NGSO applicants with the opportunity to simultaneously be authorized. For this to work, there must be:
  - A level playing field that ensures all applicants equitable access to sufficient spectrum to enable each to establish and operate a commercially-viable satellite system; and
  - Flexibility for system growth (both evolution of initial systems and potential introduction of new systems).
- The FCC should adopt a sharing plan that maximizes the efficient use of orbital and spectrum resources for today and the future.

- The virtual geostationary satellite orbit ("VGSO") architecture proposed by Virtual Geosatellite, LLC ("Virtual Geo") is very different from the NGSO concepts proposed by the other applicants in the current Ku-band NGSO processing round.

  - The VGSO architecture is premised upon the use of carefully placed repeating ground tracks by satellites in elliptical orbits with apogees of around 27,000 kilometers to produce continent-following arrays in which the satellites in each system appear stationary to users on the Earth.

  - Through their use of carefully-placed repeating ground tracks, VGSO systems are able to avoid operational-phase orbital intersections, which in turn creates a new orbital resource in which "slots" can be assigned to dozens of separate VGSO systems in each frequency band.

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- Non-VGSO NGSO satellites are able to share with existing services – including Geostationary Orbit Satellites ("GEOs") and certain types of Fixed Service ("FS") systems, assuming they conform to operational parameters and power limits established by ITU and FCC regulations;
- Although VGSO systems easily meet the power limits established by the FCC and the ITU for the protection of GEO satellites and FS systems, the nature of VGSO operation renders unnecessary the constraints and operational parameters needed to make sharing possible between non-VGSO NGSOs on the one hand, and GEOs and FS systems on the other.

- If the Ku-band NGSO FSS spectrum were to be limited to use by VGSO-type NGSO systems, as many as 168 individual continent-following VGSO satellites, or 28 separate global systems of VGSO satellites, would be able to operate co-frequency without interfering with GEOs or FS systems.
- If the Ku-band NGSO FSS spectrum were to be limited to use by non-VGSO NGSO systems, the number of co-frequency systems able to provide full global coverage would be much lower – on the order of four or five systems at the maximum – even if all such systems were homogeneous.

- Most types of NGSO systems cross each other and the GSO arc, but are able to share spectrum with GSOs and each other through the use of satellite diversity.
- Virtual geostationary orbit systems use their carefully-placed ground tracks and GSO-like "slotting" of satellites to share with each other, and use orbital separation (on the order of a minimum of 40+ degrees worldwide) to accomplish sharing with GEOs; VGSO sharing therefore does not rely on satellite diversity.
- Unfortunately, the sharing between VGSO and non-VGSO NGSO systems is very difficult and will result in phenomenal inefficiencies -- including reductions in power, system capacity and coverage area, as well as reductions in total communications throughput. Most importantly, the Commission and the public would lose the opportunity to see the establishment of an additional, allocable orbital/spectrum resource.

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- The situation among the current NGSO Ku-band applicants is similar to that of the Big LEO MSS applicants from the early 1990s.
- In the case of the Big LEOs, two different technologies were being proposed (CDMA and FDMA). If both technologies would have been required to operate co-channel, co-frequency subject to coordination, it is very doubtful either technology would have been implemented.
- In the case of the Ku-band NGSO round applicants, it is the proposed orbital configurations and number of potential co-frequency systems that distinguishes the two general classes of satellite systems proposed in this round.

- Unless the Commission requires all of the current Ku-band NGSO FSS applicants to adhere to a single technical standard, it will be necessary to implement some form of band segmentation if both virtual geostationary orbit NGSOs and NGSOs in other types of orbits are to operate in the Ku-band spectrum the Commission has made available in its First R&O in ET Docket No. 98-206.

- Virtual Geo has developed a proposal that paves the way for a Ku-band sharing approach than allows implementation opportunities for both virtual geostationary orbit and non-virtual geostationary orbit NGSO FSS systems.
- Virtual Geo's proposal avoids protracted Commission proceedings to determine compatibilities, reconcile incompatibilities or to determine whether any one technology is better than the other.

VIRTUAL GEO Ku-BAND ASSIGNMENT PLAN PROPOSAL

GATEWAY UPLINK BANDS

12.75-13.15 GHz and 13.2125-13.25 GHz Bands:

VGSO Zone: 12.75-12.960 GHz

Non-VGSO Zone: 12.9775-13.15 GHz and 13.2125-13.25 GHz

13.75-14.00 GHz Band:

VGSO Zone: 13.75-13.865 GHz

Non-VGSO Zone: 13.885-14.00 GHz

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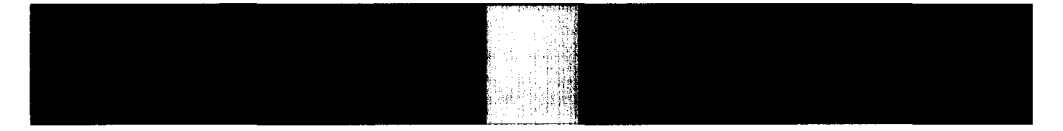
USER UPLINK BAND

14.0-14.5 GHz Band:

VGSO Orbit:	14.0-14.24 GHz
Non-VGSO Zone:	14.26-14.5 GHz



14.00 14.24 14.26 14.50

(GHz)

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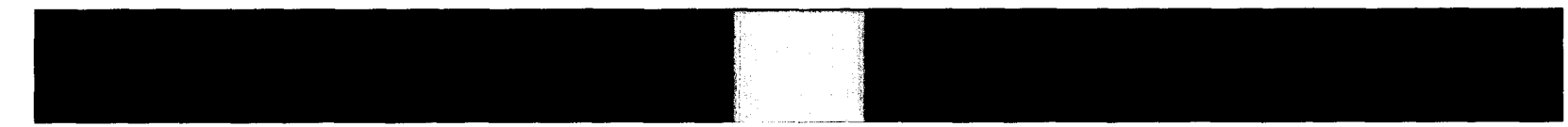
GATEWAY DOWNLINK BAND

10.7-11.7 GHz Band:

VGSO Zone: 10.7-11.175 GHz

Non-VGSO Zone: 11.225-11.7 GHz



10.70 11.175 11.225 11.70
(GHz)

USER DOWNLINK BAND

19-Jan-01

11.7-12.7 GHz Band:

Non-VGSO Orbit: 11.7-12.175 GHz

VGSO Zone: 12.225-12.7 GHz

11.70 12.175 12.225 12.70
(GHz)

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VIRTUAL GEO Ku-BAND ASSIGNMENT PLAN PROPOSAL

GATEWAY UPLINK BANDS		
12.75-13.15 GHz and 13.2125-13.25 GHz		**# MHz**
VGSO Zone	12.75-12.960 GHz	210
Growth Zone	12.960-12.9775 GHz	17.5
Non-VGSO Zone	12.9775-13.15 and 13.2125-13.25 GHz	210
13.75-14.0 GHz		**# MHz**
VGSO Zone	13.75-13.865 GHz	115
Growth Zone	13.865-13.885 GHz	20
Non-VGSO Zone	13.885-14.00 GHz	115
USER UPLINK BAND		
14.00-14.50 GHz		**# MHz**
VGSO Zone	14.00-14.24 GHz	240
Growth Zone	14.24-14.26 GHz	20
Non-VGSO Zone	14.26-14.50 GHz	240
GATEWAY DOWNLINK BAND		
10.7-11.7 GHz		**# MHz**
VGSO Zone	10.70-11.175 GHz	475
Growth Zone	11.175-11.225 GHz	50
Non-VGSO Zone	11.225-11.70 GHz	475
USER DOWNLINK BAND		
11.7-12.7 GHz		**# MHz**
Non-VGSO Zone	11.70-12.175 GHz	475
Growth Zone	12.175-12.225 GHz	50
VGSO Zone	12.225-12.70 GHz	475

SPECTRUM TOTALS:

ZONE TYPE	GATEWAY UP	GATEWAY DOWN	USER UPLINK	USER DOWNLINK	TOTAL
VGSO Zone	**325 MHz**	**475 MHz**	**240 MHz**	**475 MHz**	**1515 MHz**
Growth Zone	**37.5 MHz**	**50 MHz**	**20 MHz**	**50 MHz**	**157.5 MHz**
Non-VGSO Zone	**325 MHz**	**475 MHz**	**240 MHz**	**475 MHz**	**1515 MHz**

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- This approach borrows heavily from the segmentation approach adopted by the Commission in the Big LEO MSS proceeding, as contrasted with the "1/n" approach adopted in the 2 GHz proceeding.
- To the extent that frequency bands are going to be divided between differing technologies, each applicant must have enough spectrum (user and gateway) available to it to be viable.

- The approach proposed by Virtual Geo would accommodate the immediate introduction of VGSO and non-VGSO systems (i.e., all pending applicants);
- Virtual Geo's approach initially reserves a portion of the available spectrum to accommodate the needs of systems that are able successfully to use their initial assignments.

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- Initially, dedicated and exclusive blocks of gateway and user link spectrum would be set aside for use by VGSO and non-VGSO NGSO systems, respectively.
- The proposed spectrum assignments are based on the assumption that in each segment, the current non-VGSO systems would be assigned collectively to one large block of initial spectrum, and the VGSO systems (current and future) would be assigned collectively to the other large block of initial spectrum.

- Each system licensed in this proceeding would be allowed to build its system across all gateway and user link spectrum the Commission has made available for use by NGSO Ku-band systems.

- In the VGSO system initial spectrum zone, virtual geostationary orbit systems would coordinate with each other, but not with the non-VGSO systems.
- In the non-VGSO initial spectrum zone, systems would coordinate with each other, but not with virtual geostationary orbit systems.

- The initial spectrum zone for each of the system types would have sufficient bandwidth to accommodate the applicants' requirements.
- However, "growth zone" spectrum initially would be reserved in each band segment, and would be to be made available to accommodate system requirements for both types of systems (but would not be available for separate assignment to applicants in a new processing round).

- Within the "growth zones," virtual geostationary and non-virtual geostationary systems would be required to coordinate with each other only after one or more system(s) had: (i) entered commercial service; and (ii) exhausted the available spectrum in its initial spectrum zone.
- Each system would enter into spectrum coordination/sharing arrangements to increase the spectrum available for its type of system, but only to the extent that it could demonstrate ***actual*** spectrum requirements. This element is modeled after the existing North American GEO MSS coordination agreement.

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Public Interest Benefits of Virtual Geo Proposal

- All applicants in current processing round can be licensed.
- Post-licensing issues/disputes are minimized.
- Establishment of VGSO spectrum blocks ensures that spectrum will be available to future US and foreign systems that are willing to employ VGSO architecture.
- The plan provides flexibility to accommodate future growth of the NGSO FSS service and to take account of marketplace successes.

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